
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: December 2006

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of December, 2006, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of December was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. During December, the standard for compliance stations C-2, S-64, S-49, S-42, and S-21 were 15.5 mS/cm. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for December 2006 started off below 5,000 cfs and remained at that level until December 9, 2006. Thereafter, the first onset of precipitation started followed by several events through mid-December with little to show since most of the rainfall totals were below 1.00 inches/day. The rainfall runoffs lead outflow to increase for a short period with a peak of about 18,700 cfs for the month before dropping and leveling off to about 7,300 cfs between December 22 and 27. The month ended on a high note with outflow increasing to about 19,000 cfs as a result of river releases, rather than rainfall events since there were very minimal amount of rainfall activity at the end of the month. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for December 2006 is listed below:

Month	Mean NDOI (cubic feet per second)
December	9,317

2.3 Rainfall

December rainfall activities occurred more often than previous month, but the overall total for the month did not change significantly from prior month. Rainfall occurrences were observed in mid and a few in late December. The largest daily rainfall total of the month was 0.96 inches with most of the rainfall events occurred in mid-December. The monthly total is shown below.

Month	Total Rainfall (inches)
December	3.41

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during December 2006 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
December 1 – 31	Open	Out	Closed

SMSCG operation for December 2006 did not commence because salinity levels throughout the marsh were not of concern. However, DWR will continue to monitor salinity levels in the marsh and will operate the gates and install the flashboards if conditions warrant.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During December 2006 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were all below 14.0 mS/cm as shown in Figure 1. There were no significant salinity levels changes. The only minor reduction in salinity levels occurred between mid-December and end of December. Similar observation in salinity levels and patterns are also seen at the two monitoring stations, S35 and S97.

Overall, salinity levels in December 2006 were below standards at all compliance and monitoring stations.

S-21 (Sunrise Club) continues to be out of service since late December 2005 due to flooded event, thus S-21 station will not be reported in future reports until further notice. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season while repair work is being done at S21 site.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for December 2006 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations does not resemble any of the previous nine years, however, is most comparable to the 2000 year with all compliance and monitoring stations salinity being on the high end for the month. December 2006 salinity levels overall seems higher than other eight years, except for 2000, where C-2, S-35, and S97 salinity levels in December 2006 is lower than December 2000 year. Compared to previous nine years, December 2006 salinity levels were ranked second in high Specific Conductance, thus making it the second to last lowest salinity levels month.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****December 2006**

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	5.0	15.5	Yes
S-64	10.8	15.5	Yes
S-49****	13.4	15.5	Yes
S-42	12.6	15.5	Yes
S-21***	n/a	n/a	n/a

*milliSiemens per centimeter

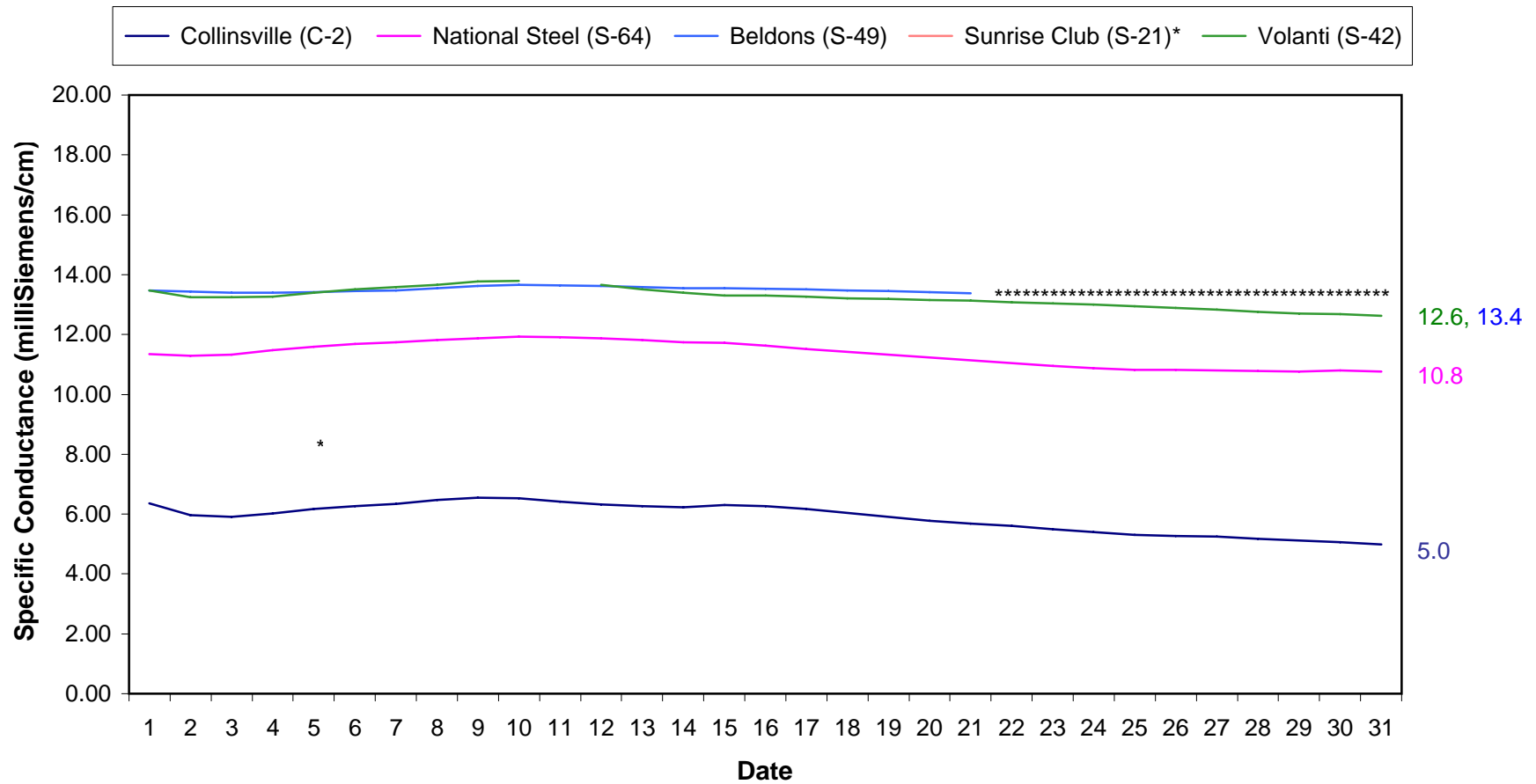
**The representative data from nearby USBR station is used in lieu of data from station C-2.

***station is temporarily out of service. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season.

****S49 value is not representative since it contains missing data, but the number of missing data is not enough to alter the end of month pdm value.

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
December 2006**

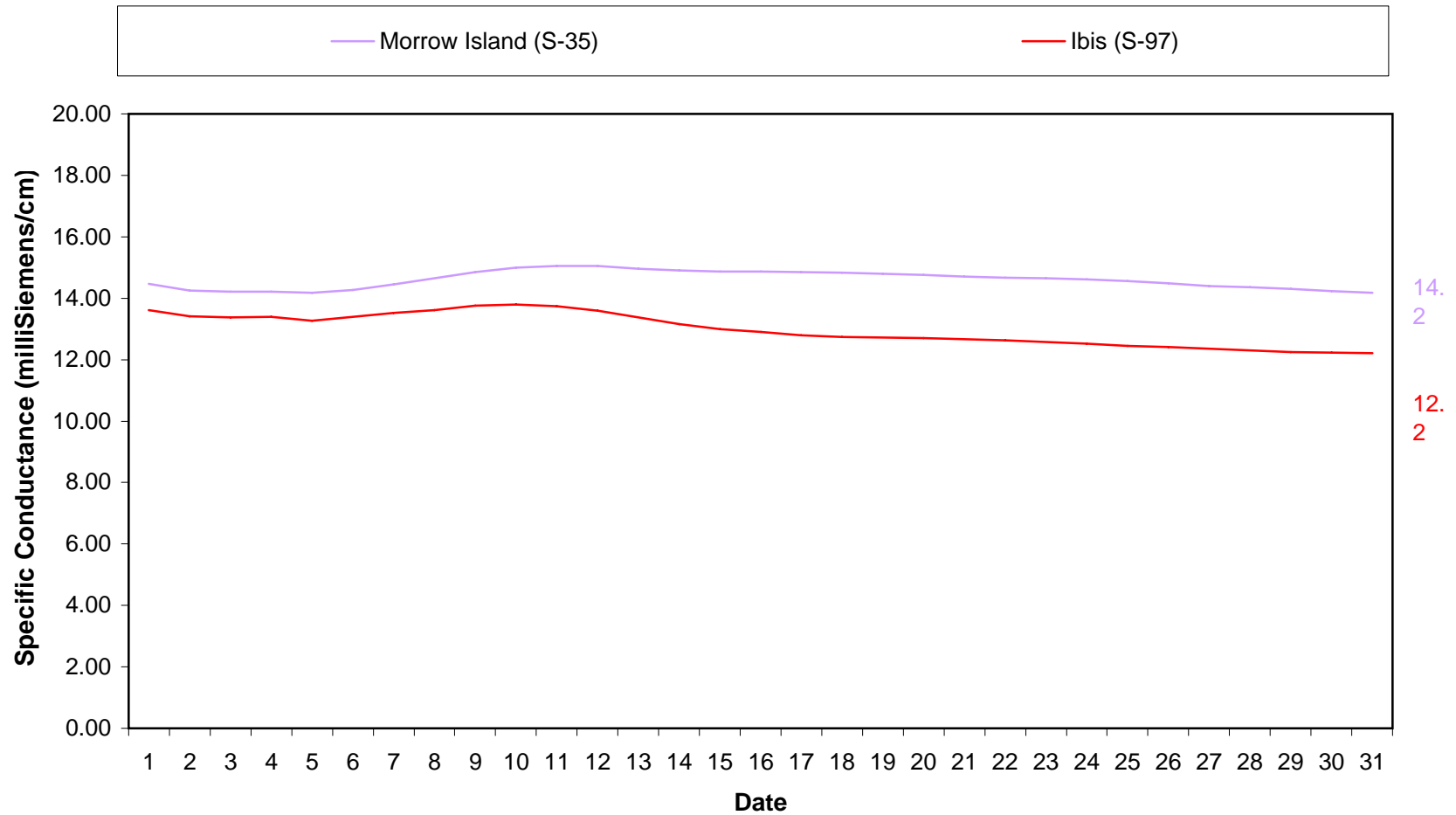
Standard = 15.5 mS/cm



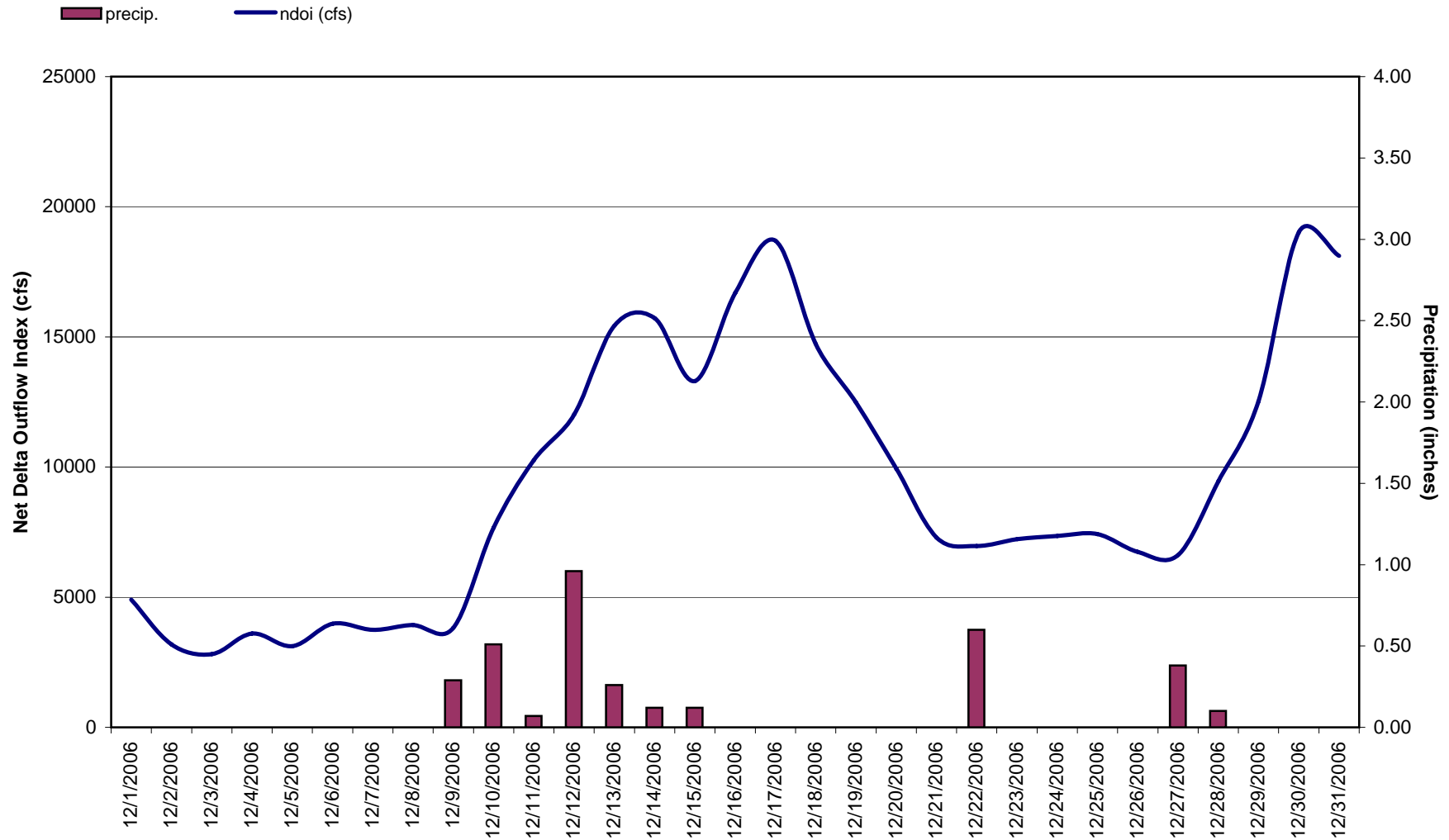
*S21 station out of service due to flood event

*** S49 data missing due to equipment problem.

**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
December 2006**

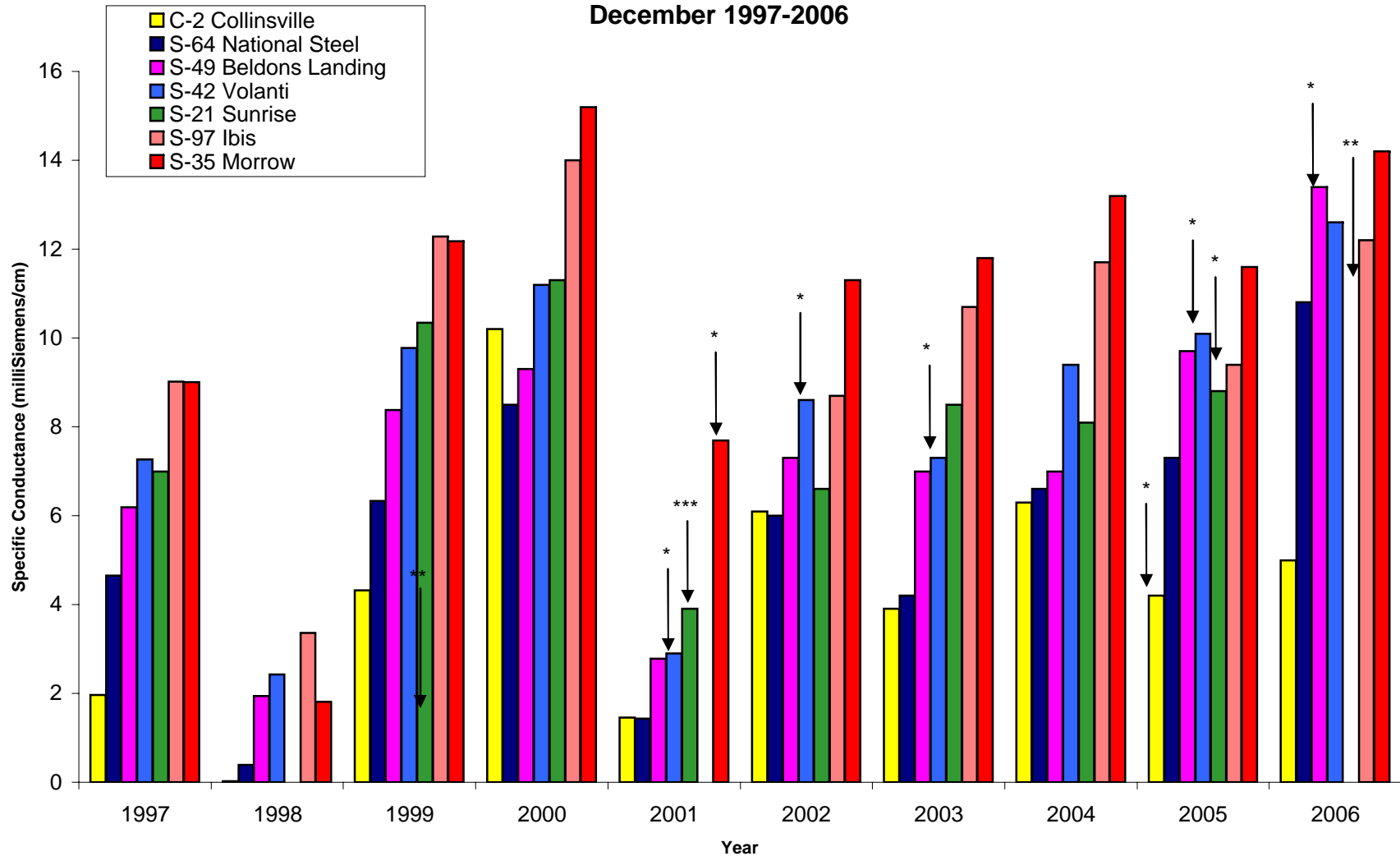


**Figure 3. Daily Net Delta Outflow Index and Precipitation*
December 2006**



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

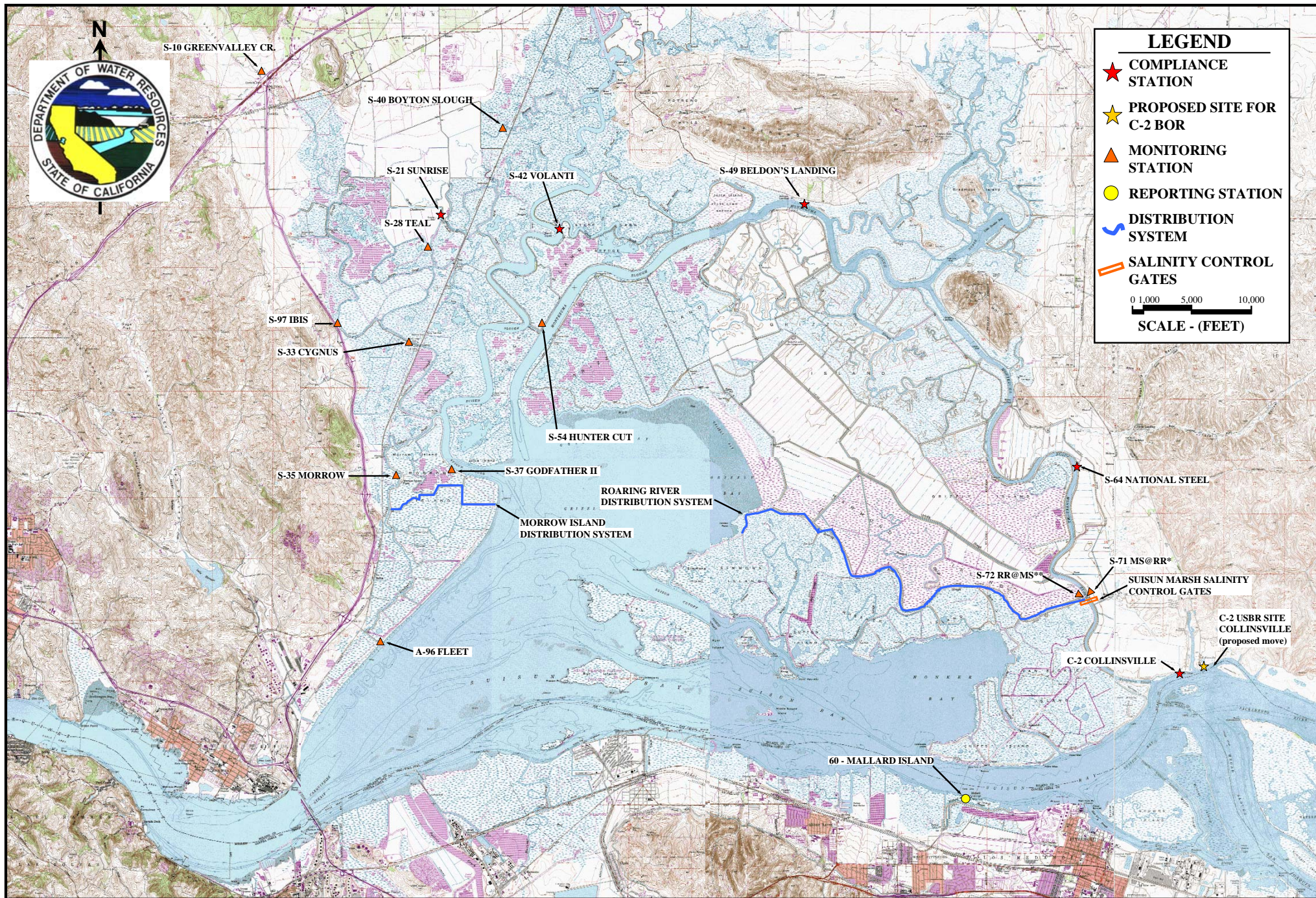
**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
December 1997-2006**



* Data does not reflect partial month. Data collection was interrupted before the end of the month due to equipment failure.

** Data was not obtained due to power problems at the station.

*** Data was not obtained due to equipment failure.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES